# EFFECTS OF PROXIMITY DIMENSIONS ON INTER-FIRM COOPERATION AMONG MSMES IN SOME SELECTED LEATHER INDUSTRIAL CLUSTERS IN NIGERIA

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## ABSTRACT

This study was carried out to investigate the effects of proximity on inter-firm cooperation in some selected leather industrial clusters in Abia, Lagos and Kano states in Nigeria. MSMEs in these states' leather manufacturing clusters were specifically chosen for the study using a two-stage sampling approach. In the cities of Lagos, Aba, and Kano, 412 MSMEs' owners and managers were chosen using the snowballing sampling technique approach. The study's sample size was this. These owners and managers completed a questionnaire to provide information on the MSMEs. Descriptive statistics and inferential statistics were used to analyse the data collected. The regression results showed that all the proximity dimension variables had significant and positive relationships with marketing cooperation. Also, institutional proximity (INP) and organisational proximity (ORG) had significant and positive relationships with R&D cooperation and only social proximity (SOP) had a positive and significant relationship with innovation cooperation. However, the $\chi^2$ test of significance showed that the pooled proximity dimensions and cooperation variables had the following significant and positive relationships with the cooperation

variables: marketing cooperation [$\chi^2$ (16,412) = 332.412, p = .000], R & D cooperation [$\chi^2$ (8, 412) = 26.909, p = .001] and innovation cooperation [$\chi^2$ (12, 412) = 41.342, p = .000]. Owing to these relationships, 9 gains out of 13 potential gains accrued to the MSMEs which may aid in the industrial growth and development of the country. These gains are: rapid innovation, new business formation, business growth, access to new markets and greater efficiency. The study concluded that due to their proximal locations, MSMEs in the selected Nigerian leather industrial clusters cooperated with one another and due to this, were able to appropriate some industrial growth and development-promoting gains to themselves. However, there were some other potential gains such as mutual learning, mutual stimulation of innovativeness, cost reduction and group purchasing that were not appropriated. The study therefore recommends that Nigerian governments, at all tiers, should formulate policies that encourage cluster formation and cooperation among the proximally located MSMEs to enable them appropriate all the potential gains derivable from cooperation.

## Introduction

The Federal Government of Nigeria (FGN) embraced the cluster concept approach in its industrial development plan in 2007 in an effort to design a policy that will accelerate industrial growth (Iwuagwu, 2011). Realising how important industrial clusters are to economies has led to emerging countries adopting industrial cluster concept strategy as a means for development (Bachter, Yuill & Davies 2005).

For instance, there exist the timber market in Accra, Ghana (Sverrisson, 1997); the Gamarra cluster in Lima, Peru (Visser, 1997 & 2000); Footwear cluster in Addis Ababa, Ethiopia (Getahun, 2016). In Nigeria, the following clusters have sprung up: the leather products cluster in Aba, Abia State; the healthcare/medical equipment clusters in Calabar, Cross River State, Ibadan , Oyo State and Ile-Ife, Osun State; ICT clusters in Yaba and Otigba, Mushin, Lagos State; automobile parts assembly clusters in Nnewi and Awka, Anambra State ; leather/garments clusters in Bauchi, Bauchi State and Kano, Kano State; textile cluster in Kaduna, Kaduna State; Engineering/Scientific clusters in Kaduna, Kaduna State and Minna, Niger State.

When considering interorganisational cooperation, innovation, and regional economic growth, the geographical concentration of firms in an area is an important component in the clustering of businesses. So, it can therefore be said that proximal location of firms usually preceedes clustering. An industrial cluster is a collection of businesses that are close to one another and benefit from resource sharing since they are situated in the same area (Bathelt, Malmberg & Maskell, 2004). A type of collaboration is the sharing of resources. For instance, when SMEs cooperate in marketing programmes, they benefit from one another because the performance of all

is enhanced. Kim (2015) corroborated this by submitting that businesses that collaborate in marketing are more likely to be more productive than those that do not. Joint marketing arrangement can lead to innovative marketing which may make firms to be globally competitive. Studies have indicated that the cooperation of firms in technology-based clusters in the area of innovation arising from research and development (R&D) may possibly lead to product and process development among others (Janssen, Bogers & Wanzenbock 2020; Herrmann, Taks & Moors, 2012).

In 2018, the leather and leather products policy in Nigeria was formulated with the aim of establishing suitable conditions to foster public-private partnership investment and stimulate growth in the leather industry. One of the challenges the policy identified was that there was a suboptimal level of interaction among market actors in the Nigerian leather value chain. There was also an absence of effective dialogue among traders, tanners and producers. Since there is suboptimal interaction among market actors, collaboration among such actors with its attendant potential benefits, may not be realised. It is yet unclear in Nigeria if as a result of the formulation and introduction of this policy, enough collaboration and cooperation have been engendered among the actors in the leather industry.

The purpose of this study is to identify the various proximity dimensions in leather industrial clusters and their influences on the cooperation variables of MSMEs in the study area. Also, the paper seeks to determine the gains, if any, which accrued to the MSMEs due to cooperation. The rest of the paper is structured as follows: section two reviews literature which are germane to the study, section three presents the methodology adopted for the study, section four reports and discusses the findings of the study while section five concludes and makes recommendations.

**Literature Review**

**A brief overview of Nigeria's industrial cluster policy:** Nigeria's attempts to create industrial sector-related policies after independence have not produced the anticipated outcomes throughout the years. Import substitution strategy, the 1972 Indigenisation Policy, the 1982 Economic Stabilisation Programme, the 1986 Structural Adjustment Programme, the 1988 Privatisation Programme, the Rolling Plans of the 1990s, the 1993 Guided Deregulation/Privatisation Programme, the 1997 Vision 2010 Programme, the 2002 Poverty Reduction Strategy, and the 2002 National Economic Empowerment and Development Strategy I (N.E.E.D.S.I.) are a few of these policies (Ekesiobi & Ibekilo, 2010; Adamu & Iyoha, 2015). In 2007, the government began to adopt industrial clusters as a development strategy because past plans to achieve Nigeria's industrial development plan had failed. Later industrial growth plans including the Seven Point Agenda, Vision 20:2020, and the Transformation Agenda were formulated based on the cluster strategy.

The notion of industrial clusters served as one of the foundations of Nigeria's Industrial Revolution Plan (NIRP) implemented in 2014. Building industrial towns, parks and clusters is one

of the goals of the country's NIRP designed to overcome the issues that caused past plans to fail (NIRP, 2014). Another important element of the concept was the creation of the infrastructure for the colocation of businesses. Some of the localities where these businesses now colocated include Nnewi (automotive parts assembly), Otigba and Yaba, Lagos State (ICT), Onitsha, Anambra State (rubber and plastics materials), Aba, Abia State (shoes and other leather products), and Kano, Kano State (hides and skin).

**Conceptual Review: Proximity**

Proximity is the space between two items, or in this study's case, the space between two or more businesses. When it comes to innovation, R&D, and cluster expansion, the concentration of businesses in one area makes it easier for economic agents to share expertise (Zsofia, 2009). A network's strong links and compactness are aided by proximity since it creates a platform for frequent contacts that may lead to the creation of formal or informal partnerships (Molina-Morales & Martinez-Fernandez, 2010). Additionally, it provides chances for conversations and knowledge exchange, aids network members in forging bonds of trust and finally, facilitating collaboration (Porter, 1998). Cognitive closeness, physical or geographical proximity, institutional proximity, organisational proximity, and social proximity were the five types of proximity that Boschma and Frenken (2010) identified.

There are different definitions of geographical proximity. In some definitions, spatial proximity is described in terms of interactions between organisations and the existence of clusters of businesses in a physical place, as opposed to those who define it as the exact geographic distance between players. Some describe it in terms of the distance in relation to the mode of transportation (travel times) and the perceived distance between the actors (Knoben & Oerlemans, 2006). The most common type of closeness employed in the literature is spatial proximity, often known as territorial, geographic, local, or physical proximity. The advantages of spatial concentration of enterprises have been covered in the literature on industrial clusters and geographical closeness.

Businesses can communicate more easily with one another due to the geographical concentration of businesses. Finding a suitable partner nearby is lot simpler for businesses than it is for engaging in a long-distance relationship (Oerlemans & Meeus, 2005). Spatial proximity facilitates face to face interaction. Knowledge may be transferred more easily through face-to-face interaction within a cluster when the distance between cluster members is shorter.

The entirety of the knowledge that each actor in a cluster possesses makes up the cognitive dimension of proximity. The idea was created by Nooteboom (2006), and it refers to agents' aggregate knowledge base and level of skill. In a cognitive proximity, all participants share and exchange knowledge from the same source. Knowledge transmission is challenging when actors are too cognitively far from one another. Knowledge transmission may not happen if the cognitive distance is not close enough (Moodysson, Coenen & Asheim, 2008).

Organisational closeness is "the amount to which relations are shared in an organisational system" (Boschma, 2005). It is the resemblance between people who have a common reference frame and body of knowledge (Boschma, 2005). Organisational closeness refers to the strength of

the bond in terms of this resemblance among the players within the participating organisations. Since the company maintains a steady control over information relating to it, outsiders may not be able to obtain the knowledge (Becker & Knudsen, 2006).

The institutional aspect of proximity refers to the consistency of elements like laws, regulations, conventions, values, and routines within a certain geographic area. Institutions are described by Knoben and Oerlemans (2006) as in North (1991) as "the humanly constructed limitations that regulate political, economic and social relationships". Both official rules like constitutions, laws, and property laws as well as informal restrictions like punishments, taboos, conventions, traditions, and codes of behaviour make up these regulations. Institutions and cultures are inextricably linked to one another (Knoben & Oerlemans, 2006). However, according to Hofstede (2001), institutions are determined by cultures which in turn reinforce cultures.

Social proximity results from shared psychological traits, interpersonal connection and a feeling of familiarity between individual performers or friends (Balland, 2010). It is that interaction between social networks of people from various organisations (Aguilera, Lethiais & Rallet, 2012). The foundation of social closeness is trust and reputation, which diffuse informal knowledge and promote collaboration (Boschma & Frenken, 2009). The reputation and trust of the network's participants are impacted by repeated engagement and experience from prior collaboration (Geldes, Felzensztein, Turkina & Durand, 2015). Collaboration between the companies becomes more likely as reputation and trust rise. A network of players can be bound together by demographic characteristics like gender and ethnicity (Ibarra, Kilduff &Tsai, 2005).

It should be mentioned though, that proximity levels play important roles in the outcomes of relationships. While too much closeness may lead to "lock in" issues that cause proximal enterprises to retreat into their own shells (Boschma, 2005), too little proximity between firms may be harmful to interactive learning and network creation.

Clusters form when spatially proximate firms share a common need that requires interaction of the firms involved. Steinle and Schiele (2002) categorised the conditions for clustering into necessary conditions and sufficient conditions. The necessary conditions hold that value-chain must be divisible i.e. different firms can specialise in different stages of the product development and final product must be transportable. This means that the product must be relocatable. The sufficient conditions are first, the value chain must be coordinated until the final product is developed. Second, the specialised organisations must be diverse with complementary competences. Third, the network of entrepreneurs who own the specialised organisations must value innovation. Clusters are formed naturally or through government intervention. Clusters can be formed naturally due to the activities of entrepreneurs. This is because, as entrepreneurs advance their business interest, they collectively take actions that could shape their local environment, such as influencing the building of institutions or attracting foreign direct investments.

Government may play a significant role in setting up a cluster. Policies may be formulated to create space or to assist the development of a new product. The primary function of government in cluster formation is to create good institutional circumstances that will facilitate the spontaneous development of firms (Xianping, 2004). In a new cluster, the government is involved in a cluster

formation through creating an enabling environment. As the cluster moves to maturity stage, then the private sector would be predominantly in charge of the cluster while the government is expected to provide support where necessary (Wong, Ho & Singh, 2010). The government formulates policies to attract new firms into the cluster, but for existing clusters, policies are formed to nurture indigenous ones out of them.

Apart from the industrial cluster formation theory hitherto highlighted, there are other theories of cluster formation. They are: the agglomeration theory of firms which suggests that firms colocate because of the positive externalities they stand to gain in such location, the industrial location theory which basically posits that firms colocate as a result of access to the market, transportation cost, distance, rent and land use and the new geography theory which focuses on how concentrating factors such as increasing returns to scale, transportation cost and linkages between the market, the suppliers, the firms and the customers influence the where  firms are concentrated.

Spatially located firms in a cluster may cooperate or collaborate with one another. Inter-firm cooperation refers to a formal or informal agreement between organisations to work together to accomplish shared or new goals more effectively and efficiently (Birru , 2011). One area of possible collaboration is the area of marketing cooperation. This type of cooperation among clustered firms can serve as a source of competitive advantage in local, regional or international marketing to the firms. This is because firms in clusters are believed to have access to marketing intelligence, customers, a stronger network and trust. They also innovate more than those in isolation (Gummesson, 2002; Styles & Amber, 2000). However, despite the potential benefits that are accruable through marketing cooperation, Oyelanran-Oyeyinka and Rasiah (2009) noted that Nigerian firms are individualistic and only about 25 – 37% are open to collaboration in marketing with other firms. This individualistic behaviour of firms affects the market size and can delay SMEs entering into international markets. Oyelanran-Oyeyinka and Rasiah (2009) therefore submitted, among other things, that marketing cooperation should be adopted by firms in clusters to enhance their market shares.

Another area where proximally located firms can cooperate is in the area of cooperation in innovation by sharing knowledge. Through inter-firm cooperation, SMEs can develop innovation capabilities comparable to those of larger companies in the areas of the introduction of new products, the introduction of new production techniques, the opening of new markets, and the development of new sources of supply for raw materials or other inputs (Schumpeter, 1934). This is because inter-firm cooperation in innovation affects productivity and performance (van Hemert, Nijkamp & Masurel, 2013; Giuliani, 2013). SMEs have limited internal resources for innovation (Rogers, 2004; De Propris, 2002). As a result, they depend on working together with other businesses to access new ideas, enhance access to inputs, and foster knowledge transfer and technical opportunity (Nieto & Santamaria, 2007).
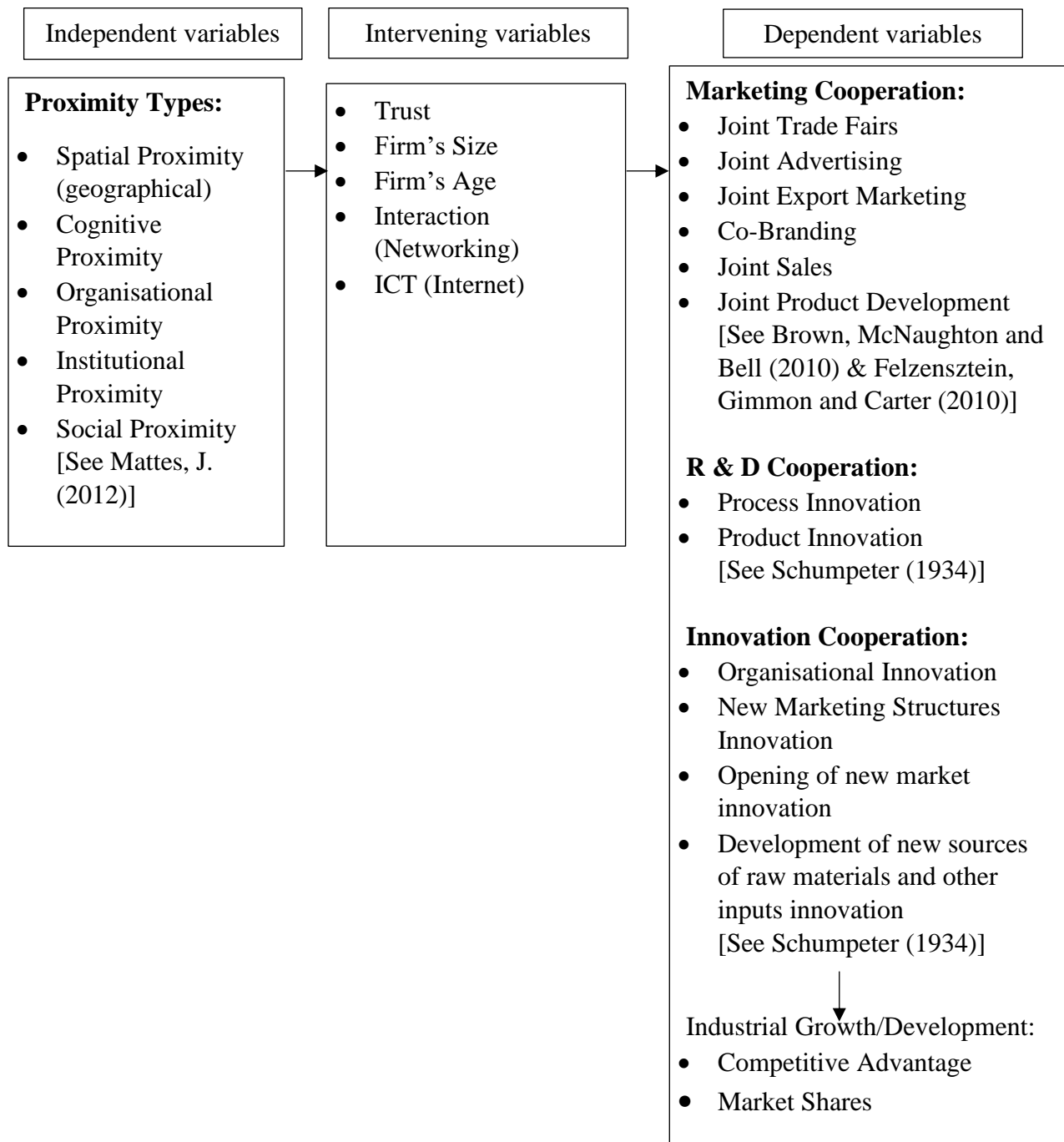
R&D collaboration is yet another area where businesses may work together. By working together on R&D, businesses may access complementing external resources. Through research, particularly for the creation of products or processes, partner companies generate knowledge that

is then shared. By enhancing the standard, convenience, and extent of information exchange, R&D partnerships have the ability to boost the results of innovation (Bento, Duarte & Heitor, 2004). Inter-firm R&D initiatives establish a knowledge base where people and groups from various organisations may exchange and preserve crucial information. They also make it easier for information to be transferred between firms, both internally and externally (Alvarez, Marin & Fonfria, 2009; Cantner, Joel & Schmidt, 2009; Tanriverdi, 2006).

It must not go unmentioned though, that all the potential benefits which are accruable to firms through cooperation may not be realised if trust among firms is absent. Trust is one of the factors that can make or mar cooperation. Fang, Palmatier, Scheer and Li (2008) observed that cooperation often fail where lack of trust exists among the firms, giving room for conflict and rivalry. Trust is the state where involved parties are confident about one another's integrity, motive, credibility, benevolence and conduct in a risk situation (Cao & Lumieau, 2015; Fang, Palmaatier, Scheer & Li, 2008). Firms which operate in high trust environment will spend less to protect themselves from economic exploitation and would likely innovate more than firms in a low trust region (Landry, Amara & Lamari, 2002).

**Conceptual Framework**
**Figure 1: Conceptual Framework of effects of proximity dimensions on inter-firm cooperation**

| Independent variables | Intervening variables | Dependent variables |
|---|---|---|

**Proximity Types:**

- Spatial Proximity (geographical)
- Cognitive Proximity
- Organisational Proximity
- Institutional Proximity
- Social Proximity
  [See Mattes, J. (2012)]

- Trust
- Firm's Size
- Firm's Age
- Interaction (Networking)
- ICT (Internet)

**Marketing Cooperation:**
- Joint Trade Fairs
- Joint Advertising
- Joint Export Marketing
- Co-Branding
- Joint Sales
- Joint Product Development
  [See Brown, McNaughton and Bell (2010) & Felzensztein, Gimmon and Carter (2010)]

**R & D Cooperation:**
- Process Innovation
- Product Innovation
  [See Schumpeter (1934)]

**Innovation Cooperation:**
- Organisational Innovation
- New Marketing Structures Innovation
- Opening of new market innovation
- Development of new sources of raw materials and other inputs innovation
  [See Schumpeter (1934)]

Industrial Growth/Development:
- Competitive Advantage
- Market Shares

**Source:  Authors' adaptation based on literature consulted.**

The conceptual framework for how proximity affects inter-firm collaboration is depicted in Figure 1. The cell on the left shows the proximity variables which are the independent variables. The cell also shows the proxies of the independent variables. The proximal dimensions of firms may cause

them to have relationships and through these relationships, cooperate and exchange for instance, knowledge in the areas of marketing, R&D and innovation which may lead to firms gaining competitive advantage and increased market shares domestically and internationally.

The Figure also shows the cooperation variables and their proxies in the right-hand side of the Figure. However, cooperation between firms may be impossible if certain factors or variables are not present in the environment or milieu where firms are proximally located. These variables appear in the middle cell of Figure 1. The presence of these variables in the environment where firms are proximally located would facilitate cooperation between firms which may lead to industrial growth and development.

**Empirical Review of Literature**
This paper reviewed past works in the area of proximity dimensions and inter-firm cooperation. Janssen, Bogers and Wanzenbock (2020) explored how the presence of systemic innovation intermediaries (SII) improved the influence of proximity dimensions on R&D collaboration. The study gathered information from a dataset of all organisations that took part in at least one R&D project under the Topconsortia for Knowledge and Innovation (TKI) programme, which the Dutch government launched in 2013. The data were analysed using Binary Logit Regression Models. According to the regression analysis, if two businesses are in the same TKI, cognitive closeness has less of an impact on the development of partnerships. However, SII improves the social ties between partners, although geographic closeness becomes less important following the entrance of intermediaries.

Benbba and Oubaih (2019) examined the nature of the connection between proximity factors and actor collaboration in the tourism industry. Data were collected by interviewing actors of Tourism in the city of Tangier in Morocco. The study found that although geographic proximity plays a vital role in the process of starting relationships, there was lack of willingness of the actors to cooperate with one another. The public sector firms were more favourably disposed to responding positively to cooperation initiative when compared to the private sector firms.
Cao, Derudder and Peng (2019) investigated the roles played by different dimensions of proximity in inter-organisational scientific collaboration. Data were acquired from the Web of Science Core Collection (WoS) in the medical sciences research network in the Yangtze River Delta region of China. The impacts of multi-dimensional proximity on inter-firm scientific cooperation were examined using the gravity model estimation approach. The findings indicated that, with the exception of cultural/linguistic proximity, both geographic and non-geographical proximity had a beneficial impact on scientific collaboration.

Fernandez, Ferrandiz and Leon (2016) investigated the role of proximity dimensions and scientific collaboration among academic institutions in Europe. The ISI Web of Science database's index of co-authored publications that were published between 2006 and 2010 by universities in the EU-15 nations served as the source of the data. The data were analysed using gravity model estimation. The study found that geographical distance and organisational proximity hindered

scientific collaboration; while similarities in scientific specialisation (cognitive proximity) and institutional proximity encourage scientific collaboration.

Geldes, Felzensztein, Turkina and Durand (2015) examined the types of relationships existing between the dimensions of proximity and inter-firm marketing cooperation. The data for the study were collected using email questionnaire from respondents in the agribusinesses located in Limari Province of Chile. The data were analysed using structural equation modelling. The study showed that while geographical proximity was neutral, social proximity had impact on inter-firm marketing collaboration.

Heringa, Horlings, Zouwen, Besselaar and Vierssen (2014) investigated the relationship between the dimensions of proximity and the outcomes of collaboration (such as publications, innovations, and the exchange of ideas). Data were collected from firms in the Dutch water sector and were analysed using Descriptive and the Kendall rank correlation analysis. The study showed that the dimensions of proximity had different effects. Geographical and organisational proximity both showed a negative correlation with hard outcomes (publications, innovation) and no correlation with soft outcomes (sharing of ideas, patent), however social and cognitive proximity had a favourable correlation with all six outcomes (joint publications, shared knowledge, innovations, patent, joint programmes and the exchange of ideas).

Herrmann, Taks and Moors (2012) examined the importance of geographical proximity to R&D collaborations among biotech firms and their innovation partners. The study used secondary data and personal interview to gather data from experts in the Flemish Biotech sector. Regression analysis was used to analyse the dataset, while qualitative analysis was performed to evaluate the respondents' responses. The study found that the establishment of trust-based relationships among the enterprises was not significantly influenced by geographical proximity. R&D partnerships over large distances were made possible, nonetheless, by lower transportation and communication expenses as well as improved online communication capabilities.

Knoben and Oerlemans (2006) reviewed the different dimensions of proximity relevant to inter-organisational collaboration. The study reviewed the relationship between the different dimensions of proximity and inter-organisational collaboration. The study found that three dimensions of proximity (geographical, organisational and technological proximities) are relevant to inter-organisational collaboration, competitive bidding, professionalism and quality sourcing. Stratified random sampling was used to select a sample size of 62 staff of the Rural Electrification Authority, Kenya. Questionnaires were administered on the selected staff. The data collected from the survey were analysed using descriptive and inferential statistics (regression). Based on the analyses done, there was a lack of compliance with the rules governing public procurement, which resulted in poor procurement performance.

**Methodology**

The study's methodology is covered in this section. The section is divided into 5 sub-sections, viz: the study area, the population of the study, sampling technique and sample size, the method of data collection and the method of data analysis.

**Study Area**

The study area is Nigeria. The country is situated in the northern latitudes between $4^0$ and $14^0$ and between $3^0$ and $15^0$ of the eastern longitudes (Oguntunde, Abiodun &Lischeid, 2011 in Allu & Ochedi, 2015) in the West African sub-region. It has a land mass of about 923,768 square kilometres and an estimated population of about 226 million people in 2021(Falola, Ajayi, Udo &Kirk-Greene, 2022). The country's industrial sector is not well-developed. According to O'Neill (2022), in 2020, agriculture contributed around 24.14 percent to Nigeria's GDP, 28.22 percent came from industry while 46.39 percent came from the service sector. So, it can be said that the Nigerian economy is service sector dominated.

**Population of the Study**

The study population is made up of all MSMEs producing leather products in Nigeria. These MSMEs are located in the leather industrial clusters in Kano, Lagos, Abia, Anambra, Katsina, Sokoto states and the Federal Capital Territory (FCT).

**Sampling Technique and Sample Size**

The study used a two-stage sampling strategy. Three cluster regions in Kano State, Lagos State, and Abia State were purposively chosen from the study's participant population. Three criteria were considered in selecting these locations for the research. First, compared to the other areas, they are more heavily involved in leather works. Second, MSMEs are also involved in the three different kinds of leather works common in Nigeria, namely: the processing of unfinished hides and skin into intermediate leather products, the production of bags, shoes, and leather accessories using the intermediate products, and the marketing of the bags, shoes, and leather accessories to the final consumers. Furthermore, they are in possession of all the information pertaining to these important leather works operations.

The study's enumerators visited the selected clusters in the three states of the federation and used snowballing sampling technique to randomly select 412 owners/managers of MSMEs in the clusters. This constituted the sample size of the study. The following requirements must be met in order for owners or managers of MSMEs to be included: one, the number of employees must between 1 and 9 for microenterprises; they must be between 10 and 49 for small enterprises and they must be between 50 and 249 for medium scale enterprises (OECD, 2022). Two, their work must be leather works related. Three, they must have been engaged in some kind of cooperation with other MSMEs in the clusters they belong to.

**Method of Data Collection**

The study used primary data for the study. A structured questionnaire was designed and administered on the owners/managers of the MSMEs in the clusters. Oral interviews were also used to explain any part of the questions in the questionnaire that were not clear to the respondents.

## Method of Data Analysis

Descriptive and inferential statistics were used to analyse the data collected from the respondents. Descriptive statistics like percentages, means and frequencies was used to analyse data on the biometrics (age, level of education and the scale of operation) of the respondents and the MSMEs. Inferential statistics was used to analyse the data collected. To test the following null hypothesis, Seemingly Unrelated Regression (SURE) was adopted:

$H_O$: There are no significant relationships between MSMEs' proximal location variables and the inter-firm cooperation variables in the study area.

This was done by fitting the data collected into econometric models of the forms:

$$MC_i = \beta_0 + \beta_1 SPG_i + \beta_2 COP_i + \beta_3 ORP_i + \beta_4 INP_i + \beta_5 SOPi + U_i \ldots\ldots\ldots\ldots\ (1)$$
$$RDC_i = \beta_0 + \beta_1 SPG_i + \beta_2 COP_i + \beta_3 ORP_i + \beta_4 INP_i + \beta_5 SOPi + U_i \ldots\ldots\ldots\ldots (2)$$
$$IC_i = \beta_0 + \beta_1 SPG_i + \beta_2 COP_i + \beta_3 ORP_i + \beta_4 INP_i + \beta_5 SOPi + U_i \ldots\ldots\ldots\ldots\ldots (3)$$

Where:

MC = Marketing Cooperation Variable
RDC = R&D Cooperation Variable
IC = Innovation Cooperation Variable
SPG = Spatial or Geographical Proximity Variable
COP = Cognitive Proximity Variable
ORP = Organisational Proximity Variable
INP = Institutional Proximity Variable
SOP = Social Proximity Variable
$\beta_0$ = Estimators of the intercept terms of equations (1) to (3)
$\beta_1 - \beta_5$ = Estimators of the Proximity Variables of equations (1) to (3)
$U_i$ = Stochastic Error Terms in equations (1) to (3)

**FINDINGS AND DISCUSSION**

This section presents and discusses the information collected from the respondents of this study.

**Table 1: Socio-Economic Characteristics of the Respondents**

|  |  | Frequency | Percentage |
|---|---|---|---|
| Distribution of Respondents by location | Lagos | 127 | 30.8 |
|  | Aba | 154 | 37.4 |
|  | Kano | 131 | 31.8 |
|  | **Total** | **412** | **100.0** |
| Distribution of Respondents by Gender | Female | 94 | 22.8 |
|  | Male | 318 | 77.2 |
|  | **Total** | **412** | **100.0** |
| Distribution of the businesses by ownership structure | Sole Proprietor | 325 | 78.9 |
|  | Joint Ownership | 87 | 21.1 |
|  | **Total** | **412** | **100.0** |
| Distribution of the businesses by number of employees | 0 – 5 | 271 | 65.8 |
|  | 6 – 10 | 123 | 29.9 |
|  | 11 – 15 | 17 | 4.1 |
|  | 16 – 20 | 1 | 0.2 |
|  | **Total** | **412** | **100.0** |
| Distribution of Respondents by level of education | No formal education | 17 | 4.1 |
|  | Primary School | 38 | 9.2 |
|  | JSSC | 17 | 4.1 |
|  | SSC | 203 | 49.3 |
|  | Graduate | 97 | 23.5 |
|  | Postgraduate | 40 | 9.7 |
|  | **Tota**l | **412** | **100.0** |
| Distribution of businesses by age | 0 – 10 | 240 | 58.2 |
|  | 11 – 20 | 129 | 31.3 |
|  | 21 – 30 | 33 | 8.0 |
|  | 31 – 40 | 10 | 2.4 |
|  | **Total** | **412** | **100.0** |

**Source**: Field Survey, 2022

Table 1 shows the distribution of the respondents based on location. Out of the 412 respondents, 127 (30.8%) of them were from Lagos State, 154 (37.4%) of them were from Aba, Abia state and the remaining 131 (31.8%) of the respondents were from Kano state. The data show that more respondents were reached in Abia state. This may be due to the fact that it was observed that in the Aba Leather industrial cluster, space is more densely populated as many independent businesses often share space.

Additionally, Table 1 displayed the respondents' gender distribution. The Table shows that 94 (22.8%) of the respondents are females while 318 (77.2%) of them are males. The respondents' gender distribution showed that ninety-four respondents representing 22.8% of the total respondents are females. In contrast, three hundred and eighteen (318) respondents representing 77.2% of the total respondents are males. The data supports an earlier study by Mudungwe (2012) who observed that the male gender dominated the leather industry in Kenya. In India, out of the 500 business owners studied in the leather industry in the Special Economic Zone (SEZ), none of them was a woman (Charulakshmi, Thaiyalnayaki & Chandrachud, 2019). Some of the arguments advanced for the low level of women participation in business ownership in the leather industry included men being perceived as breadwinners, lack of family support for women in business, marital status of women and government's focus on employment rather than entrepreneurship development (Benedict, Gitonga, Agyeman & Kyei, 2021; Charulakshmi, Thaiyalnayaki & Chandrachud, 2019).

Table 1 further shows the distribution of respondents by ownership structure. A total number of 325 (78.8%) of the respondents are sole proprietors while 87 (21.1%) of the respondents jointly owned businesses. Most of the respondents are sole proprietors, and that is the dominant business structure in Nigeria. This result is in agreement with Tessema (2013) and Mutinda, Onyancha and Peter (2019) who observed that the leather industry is dominated by sole proprietors. Mutinda, Onyancha and Peter (2019) argued that the sole proprietorship business is dominant in the leather industry because of the African apprenticeship system and ease of entry into the industry. The African apprenticeship system is an age-old method of training young people in trades and crafts, agriculture and business in Nigeria and throughout Africa.

It can also be seen from Table 1, the distribution of respondents by the number of employees employed by the businesses. 271 (65.8%) of the respondents have between 0 to 5 employees while 123 (29.9%) of the respondents have between 6 to 10 employees. Furthermore, 17 (4.1%) of the respondents have between 11 to 15 employees and only 1 (0.2%) of the respondents has 16 to 20 employees. The Table shows that most of the respondents have between 0 to 5 employees which is an indication that there are more micro enterprises in the clusters studied. This result agrees with Hilman and Gorondutse (2015) who found that 80% of the leather firms in Lagos and Kano have less than 20 employees. The small sizes of these firms may increase the possibility of social interaction among owners/managers of the MSMEs.

Table 1 also presents the academic qualifications of the respondents. The Table shows that 203 (49%) of the respondents have a senior school certificate. From the Table, it can be seen that 97 (23.5%) of the respondents are graduates while 40 (9.7%) of the respondents have postgraduate degrees, 38 (9.2%) of them hold primary school certificates, 17 (4.1%) of the respondents have Junior Secondary School Certificate (JSSC) while 17 (4.1%) of them have no formal education. Majority of the respondents are West African School Certificate (SSC) holders, so their ICT adoption may be low because of their level of education. This may limit their ability to share knowledge.

Table 1 also presents the distribution of businesses by age. 240 (58.2%) of the respondents reported that their businesses' age is 10 years and below. 129 (31.3%) of them put the age of their businesses at between 11 and 20 years, 33 (8%) of them said the age of their businesses is between 21 and 30 years while 10 (2.4%) of them reported the age of their business as between 31 and 40 years. This may be due to the fact that successive Nigerian governments have not paid adequate attention to cluster formation as a strategy for industrial development (Iwuagwu , 2011) . Nigeria's first industrial cluster policy was formulated in 2007.

**Table 2: Types of proximity dimension of MSMEs**

| Types of Proximity | Frequency | Percentage | Rank |
|---|---|---|---|
| Social Proximity  (SOP) | 222 | 53.9 | 1st |
| Spatial Proximity (SPG) | 179 | 43.4 | 2nd |
| Organisational Proximity (ORP) | 156 | 37.9 | 3rd |
| Cognitive Proximity (COP) | 49 | 11.9 | 4th |
| Institutional Proximity (INP) | 32 | 7.8 | 5th |

Source: Field Survey, 2022

The distribution of respondents as shown in Table 2 indicated their closeness to other firms. 222 respondents or 53.9% said that their closeness to other firms was based on social proximity. Other aspects of proximity were given lower rankings than social proximity. These rankings indicate that the company owners consider themselves to be socially connected to other companies. This results validate the findings of Letaifa and Rabeau (2013) and Geldes, Felzensztein, Turkina and Durand (2015) which revealed that social proximity is the most common aspect of proximity. Entrepreneurial activity in an area is stimulated by the ability of the Entrepreneurs in a cluster to promote social relationships, which will eventually result in economic development (Feldman & Francis, 2004).

43.4 percent or 179 respondents claimed that their proximity to other MSMEs is based on their geographic location. With little technology, geographical location can stimulate economic activities in a physical goods sector. Organisational proximity was cited as the reason for engagement by 156 respondents or 37.9%. Organisational proximity affects a firm's willingness to collaborate (Heringa, Hessels & van der Zouwen, 2016). 49 and 32 respondents or 11.9% and 7.8% of the respondents indicated that cognitive and institutional proximities were the bases of their interaction with other firms respectively. The findings of this study demonstrate that MSMEs ranked cognitive and institutional proximities very low on the types of proximity dimensions in

study area. Cognitive and institutional proximities were not seen as being as significant in MSMEs' collaboration in Nigeria's leather sector as the other previously discussed characteristics.

**Table 3: Assessment of levels of inter-firm cooperation by frequencies and percentages.**

| Cooperation Variable | Levels | Frequency | Percentage |
|---|---|---|---|
| Marketing Cooperation (MC) | | | |
| | No Marketing Cooperation | 156 | 37.9 |
| | Marketing Cooperation | 256 | 62.2 |
| | **Total** | **412** | **100.0** |
| R & D Cooperation (RDC) | | | |
| | No R & D Cooperation | 351 | 85.2 |
| | R & D Cooperation | 61 | 14.8 |
| | **Total** | **412** | **100** |
| Innovation Cooperation (IC) | | | |
| | No Innovation Cooperation | 207 | 50.2 |
| | Innovation Cooperation | 205 | 49.7 |
| | **Total** | **412** | **100.0** |

Source: Field Survey, 2022

Table 3 shows the level of the respondents' involvement in marketing cooperation. 256 or (62.2%) of the respondents are involved in marketing cooperation while 156 or 37.9% of the respondents are not involved in marketing cooperation. This result showed a relatively high rate of marketing cooperation among the leather industrial clusters, which is in line with Geldes, Felzensztein, Turkina and Durand (2015), Guercini and Woodside (2012) and Brown, McNaughton and Bell (2010) who argued that firms in non-technological clusters like those selected for this study, cooperate more in activities like marketing.

Table 3 also shows the level of R & D cooperation level among the MSMEs. 61 or (14.8%) of the MSMEs that participated in the study are involved in R & D cooperation while 351 or (85.2%) of the respondents MSMEs did not engage in R & D cooperation. Although the selected clusters have academic and research institutions like the University of Lagos, Ado Bayero University, Kano and Abia State Polytechnic within their regions, R & D cooperation had the lowest rating. This outcome may not be unconnected to the cost of R & D activities which if undertaken are largely irrecoverable if the outcome is not positive (Manez, Rochina-Barrachina, Sanchis-Llopis & Sanchis-Llopis, 2015).

Table 3 also presents the distribution of the MSMEs by innovation cooperation. The Table shows that 205 or 49.76% of the MSMEs undertook innovation cooperation with other MSMEs in the clusters while 207 or 50.24% of the MSMEs in the clusters were not involved in innovation cooperation with other MSMEs. The high rate of MSMEs not engaged in innovation cooperation may be attributable to the poor integration of technology in their operations (Atsu & Ojong, 2014).

To further validate the results in Table 3, the mean score of the level of inter-firm cooperation among the respondents was examined. It showed that marketing cooperation variable has a mean score of 0.2149, while R & D cooperation has 0.0752 and the innovation cooperation variable has 0.1596 mean score. The results show that Nigerian MSMEs' propensity to cooperate is very low but are likely to engage in marketing cooperation than innovation and R & D cooperation.

**Table 4: The results of SURE regression of individual proximity dimension on the three types of cooperation.**

|  | Coef. | Std. Err. | z | p-value |
|---|---|---|---|---|
| **Marketing Cooperation (MC): Dependent Variable** | | | | |
| Spatial proximity (SPG) | .243371 | .017287 | 14.08 | 0.000 |
| Cognitive proximity (COP) | .119993 | .0222314 | 5.40 | 0.000 |
| Institutional proximity (INP) | .0938814 | .0270215 | 3.47 | 0.001 |
| Organisational proximity (ORP) | .0769916 | .0144895 | 5.31 | 0.000 |
| Social proximity (SOP) | .1389846 | .0183944 | 7.56 | 0.000 |
| $R^2 = 0.618$    Chi-square = 665.80 | | | | |
| | | | | |
| **R & D  Cooperation (RDC): Dependent Variable** | | | | |
| Spatial proximity (SPG) | -.0170433 | .0233921 | -0.73 | 0.466 |
| Cognitive proximity (COP) | .0206513 | .0300827 | 0.69 | 0.492 |
| Institutional proximity (INP) | .0694244 | .0365643 | 1.90 | 0.058 |
| Organisational proximity (ORP) | .0797587 | .0196066 | 4.07 | 0.000 |
| Social proximity (SOP) | -.0503567 | .0248905 | -2.02 | 0.043 |
| $R^2 = 0.088$   Chi-square = 40.18 | | | | |
| | | | | |
| **Innovation cooperation (IC): Dependent Variable** | | | | |
| Spatial proximity (SPG) | -.0922001 | .0217395 | -4.24 | 0.000 |
| Cognitive proximity (COP) | -.0574873 | .0279573 | -2.06 | 0.040 |
| Institutional proximity (INP) | -.055128 | .0339811 | -1.62 | 0.105 |
| Organisational proximity (ORP) | .0025265 | .0182214 | 0.14 | 0.890 |
| Social proximity (SOP) | .1802235 | .023132 | 7.79 | 0.000 |
| $R^2 = 0.193$    Chi-square = 98.22 | | | | |

Source: Authors' Calculations based on data collected from Field Survey, 2022

Table 4 presents the $R^2$ and the Chi-square statistics of the regression of the cooperation variables on the proximity variables. In the model that regresses marketing cooperation variable on the proximity variables, an $R^2$ of about 0.62 shows that about 62% of the variations in marketing cooperation is explained by the proximity variables. Also with a chi-square of 665.80 (p = 0.000) that is statistically significant, it can be said that this model is quite appropriate. In the model that regresses innovation cooperation variable on the proximity variables, an $R^2$ of about 0.09 shows that the variations in innovation cooperation variables are not significantly explained by the proximity variables. However, with a chi-square value of 40.18 (p = 0.000) that is statistically significant then the model can be adjudged to be appropriate. In the model that regresses R & D cooperation variable on the proximity variables, an $R^2$ of about 0.19 shows that the variations in

the R & D cooperation variable are not significantly explained by the proximity variables. However, with a statistically significant chi-square value of 98.22 (p = 0.000) then the model can be deemed as appropriate.

The Table also presents the results of the regression of proximity variables on the cooperation variables. The Table shows that at a 1% level of significance in the model that regresses marketing cooperation on proximity dimensions, all proximity dimensions or variables are statistically significant. They also positively affect marketing cooperation variables. If spatial proximity increases by 100%, marketing cooperation will increase by 24%. If cognitive proximity increases by 100%, marketing cooperation will increase by about 12%. If institutional proximity increases by 100%, marketing cooperation will increase by about 9%. If organisational proximity increases by 100%, marketing cooperation will increase by 8% and if social proximity increases by 100%, marketing cooperation will increase by about 14%. These results imply that all proximity dimensions positively affect marketing cooperation. This corroborates Felzensztein, Gimmon and Aqueveque (2012) who observed that business owners in a cluster see greater benefits and chances for inter-firm collaboration in marketing operations.

At a 5% level of significance, spatial proximity and cognitive proximity variables are not statistically significant and therefore do not affect R & D cooperation. At a 5% level, social proximity is statistically significant but is wrongly signed. At a 5% level and even at a 1% level of significance, organisational proximity is statistically significant. So, if organisational proximity increases by 100%, R & D cooperation among the businesses would increase by about 8%. Also, at a 10% level of significance, institutional proximity is statistically significant. This implies that if institutional proximity increases by 100%, R & D collaboration among the clustered businesses would increase by about 7%. When business owners share from the same knowledge base, they learn from one another and collaboration in research and development has been proved to influence innovation and economic growth (Un, Cuervo-Cazurra & Asakawa, 2010). The negative signs preceding the coefficients of the spatial and social proximity variables were also obtained in the studies of Letaifa and Rabeau (2013) and Mattes (2012). They have argued that these variables may act this way because initially they may be facilitators of other forms of proximity and would cease to play a significant role when other forms of proximity become active.

At a 1% level of significance, social proximity variable is statistically significant and positively affects innovation cooperation. This implies that if social proximity variable increases by 100%, innovation cooperation among the clustered MSMEs would increase by about 18%. Also, at a 1% level of significance, spatial proximity variable is statistically significant but is wrongly signed. At a 5% level of significance, cognitive proximity variable is statistically significant but is also wrongly signed. At a 5% level of significance, institutional proximity variable is not statistically significant and is wrongly signed. At a 5% level of significance, organisational proximity is not statistically significant. So it is only the social proximity variable that positively affects innovation cooperation in the study area. This corroborates the studies of Steinmo and Rasmussen (2016) and Mattes (2012) which submitted that social proximity variable is one of the variables that can positively influence innovation cooperation.

**Table 5: Results of Chi-square test of significance performed on pooled data on proximity variables against pooled data on cooperation variables.**

| Marketing Cooperation (MC) | | | |
|---|---|---|---|
| | Value | Df | Asymptotic Significance (2-sided) |
| Pearson Chi-Square | 332.412[a] | 16 | .000 |
| Likelihood Ratio | 362.901 | 16 | .000 |
| Linear-by-Linear Association | 226.917 | 1 | .000 |
| N of Valid Cases | 412 | | |
| | | | |
| R & D Cooperation (RDC) | | | |
| | Value | Df | Asymptotic Significance (2-sided) |
| Pearson Chi-Square | 26.909[a] | 8 | .001 |
| Likelihood Ratio | 28.217 | 8 | .000 |
| Linear-by-Linear Association | 2.920 | 1 | .087 |
| N of Valid Cases | 412 | | |
| | | | |
| Innovation Cooperation (IC) | | | |
| | Value | Df | Asymptotic Significance (2-sided) |
| Pearson Chi-Square | 41.342[a] | 12 | .000 |
| Likelihood Ratio | 42.662 | 12 | .000 |
| Linear-by-Linear Association | 14.678 | 1 | .000 |
| N of Valid Cases | 412 | | |

**Source**: Authors' calculations based on data collected from Field Survey, 2022

Table 5 shows the results of chi-square test of significance performed on the pooled data on proximity variables against the pooled data on cooperation variables. This test is needed because in Table 4, all the proximity variables have positive relationship with marketing cooperation but the relationship between proximity variables and R & D cooperation and innovation cooperation are ambiguous since only two proximity variables have positive relationships with R & D cooperation and only one proximity variable has a positive relationship with innovation cooperation. The results in Table 5 show that the pooled proximity variables are positive and significantly associated with the pooled marketing, R & D and innovation cooperation variables at a 5% level of significance.

Table 6: Multiple Regression results of Cooperation gains by cooperation types

| SN | Gains | Marketing Cooperation | Innovation Cooperation | R & D Cooperation |
|---|---|---|---|---|
| 1 | Attracting investor | -.147 (.000) | .97 (.000) | |
| 2 | Rapid innovation | -.143 (.000) | | .109 (.002) |
| 3 | New business formation | .090 (.000) | .099 (.000) | |
| 4 | Business growth | .088 (.000) | | -.62 (.019) |
| 5 | Access to information | | .54 (.009) | |
| 6 | Access to partners resources | .046 (.041) | | |
| 7 | Use of market opportunities | | .040 (048) | |
| 8 | Access to new markets | .119 (.000) | .055 (.039) | |
| 9 | Greater efficiency | .120 (.000) | | |
| 10 | Mutual Learning | | | |
| 11 | Mutual stimulation of innovativeness | | | |
| 12 | Cost reduction | | | |
| 13 | Group Purchasing | | | |

Source: Authors' calculations based on data collected from Field Survey, 2022

Table 10 presents the gains that can be derived from the cooperation variables. The Table shows that marketing cooperation contributed significantly to business growth. R & D cooperation contributed positively and significantly to business growth but its estimator or coefficient was wrongly signed. Innovation cooperation did not contribute significantly to business growth.

Marketing cooperation and innovation cooperation contributed positively and significantly to access to new markets but R & D cooperation did not. Marketing cooperation contributed positively and significantly to greater efficiency of the MSMEs but innovation cooperation and R & D cooperation did not.

Innovation cooperation contributed positively and significantly to ability of MSMEs to access information but marketing cooperation and R & D cooperation did not. Innovation cooperation enabled the MSMEs to significantly exploit market opportunities but marketing cooperation and R & D cooperation did not. Innovation cooperation contributed positively and significantly to MSMEs to attract investors. Marketing cooperation significantly contributed to attracting investors but its estimator or coefficient is wrongly signed. R & D cooperation neither contributed positively nor significantly to MSMEs attracting investors.

R & D cooperation contributed positively and significantly to rapid innovation. Also marketing cooperation contributed significantly to rapid innovation but it was wrongly signed. Innovation cooperation neither positively nor significantly contribute to MSMEs' rapid innovation.

Marketing cooperation and innovation cooperation positively and significantly contributed to new business formation in the leather industrial clusters but R & D cooperation did not. Marketing cooperation positively and significantly made the MSMEs have access to partners' resources. But innovation cooperation and R & D cooperation did not make MSMEs have access to partners' resources.

Marketing cooperation, innovation cooperation and R & D cooperation did not contribute positively and significantly to mutual learning, group purchasing, cost reduction and mutual stimulation of innovation among the MSMEs in the leather industrial clusters.

## Conclusion and Recommendations
## Conclusion

From the findings in section (4.0), the following can be concluded: Firstly, MSMEs in the selected clusters related with one another socially, spatially, organisationally, cognitively, institutionally albeit at varying degrees. Secondly, due to these relationships, the MSMEs were able to cooperate in the areas of marketing, R&D and innovation. Thirdly, as a result of cooperation in these areas, the MSMEs were able to appropriate to themselves such gains as business growth, access to new markets, greater efficiency, access to information, use of market opportunities, attraction of investors, rapid innovation, new business formation and access to partners' resources. Fourthly, the MSMEs were unable to appropriate to themselves such gains as mutual learning, mutual stimulation of innovativeness, cost reduction and group purchasing.

## Recommendations

Based on the conclusion in (5.1), the following are recommended:

### Provision of Necessary Infrastructure to MSMEs:

Governments in Nigeria, at all levels, should prioritise infrastructural development in the regions where these clusters are located. From Table 2, it can be observed that the MSMEs did not relate much cognitively and institutionally. If the clusters are provided with good road networks, electricity supply, storage facilities and modern telecommunications networks, more MSMEs would be attracted to these clusters and may relate more in all the types of proximity relationships, most especially cognitively and institutionally.

### Encouragement of More Cooperation Among the MSMEs:

This study has shown that owing to cooperation in the areas of marketing, R&D and innovation, the MSMEs in the selected clusters have been able to appropriate some gains to themselves. However, there were some gains that they were unable to appropriate. More of the appropriated gains and the unappropriated ones may accrue to the MSMEs if requisite policies are formulated

by governments to encourage more of them to engage in more cooperation. For instance, in the area of R&D, research centres can be built in the clusters where the MSMEs can collaborate with academia in research efforts. The findings from these efforts can be disseminated for product and process development. Also, in order to encourage more innovation cooperation among the MSMEs, governments can, through fiscal inducements in form of tax-breaks and accelerated depreciation on equipment, encourage them to set-up incubation centres for the development of product and process ideas.

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